

## Sampling of Ground Water Studies in the Upper Missouri River Basin

### Gallatin Valley

In 1964, the United States Geological Society (USGS) conducted a detailed study of the water resources of the Gallatin Valley including both surface and ground water. The study was conducted, in part, to determine if ground water could be used to expand irrigation. After documenting a substantial ground water resource, the study concluded:

Increase in the consumptive use of ground water within the valley would reduce natural discharge from the valley by an amount equal to the volume used. Because the principal areas of ground-water discharge by evapotranspiration would be the last to be affected by withdrawals of ground water, nearly all the ground-water use would be reflected by a corresponding reduction in surface-water outflow from the valley. The reduction would be caused in part by a diminution of ground-water discharge into streams and in part by loss of surplus surface water to ground-water storage, and would occur principally during the later part of the irrigation season.

If, in making plans for further development of the ground-water resources of the Gallatin Valley, plans were made also for augmenting the recharge to the ground-water reservoir, the volume of ground water that could be used consumptively each year without exhausting the supply would be increased.

### Beaverhead River

The Beaverhead Groundwater Project was conducted from 1991 to 1996 as part of a cooperation study by the US Bureau of Reclamation, DNRC, the USGS, the East Bench Irrigation District, and the Montana Power Company. One of the purposes of the study was to analyze the relationship between surface water and the ground water aquifers south of Dillon. The study concluded that a large volume of groundwater was stored in the aquifers, and irrigation wells had not "substantially" affected stream flow. The ground water model developed as part of the study predicted that if irrigation well withdrawals were increased by 95 cfs, surface flows would be reduced by an average of about 7 cfs, equaling 7.4 percent of the additional amount pumped.

### Smith River

In 2003, DNRC issued the Smith River Basin Permit and Change Applications Supplemental Environmental Assessment which analyzed the cumulative impacts of eight ground water permit applications, one surface water application, and six change applications. The ground water model developed in this study predicted the volume of stream flow depletion in the first year of pumping would be 37% of the volume pumped with the percentage of stream flow depletion increasing as pumping continued into the future. The USGS is currently conducting a more in-depth three and one-half year study of the upper Smith River basin in cooperation with the Meagher conservation district.

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### **Basin Closure and Legal Water Availability**

In 1993, the legislature adopted the Teton, Jefferson/Madison, and Upper Missouri River basin closures. All of these closures were in response to the Upper Missouri River Basin water reservation proceedings.

The water reservation proceeding involved instream flow applications filed by the Department of Fish, Wildlife & Parks (DFWP), the old Montana Department of Health and Environmental Science (DHES), and the U.S. Bureau of Land Management (BLM) and consumptive use applications filed by a number of municipalities and conservation districts. Between applicants and objectors, the proceedings included most of the water right interests in the basin.

The proceedings generated a large amount of evidence and weeks of hearings. Agricultural groups introduced testimony showing that the Beaverhead, Red Rock, Big Hole, Ruby, Boulder, Jefferson, Gallatin, East Gallatin, Smith, Dearborn, Sun, and Teton Rivers were all fully appropriated based on agricultural claims alone. In addition, the Montana Power Company and the Bureau of Reclamation provided evidence concerning their water rights at the Missouri River dams. Finally, DNRC prepared a water availability computer model, which was later updated in 1997, that confirmed that no additional water is available for surface water appropriation except during high spring flows in occasional wet years.

With this evidence, the Board granted extensive instream flow and consumptive use water reservations, but added a condition that the reservations "shall have no force and effect in any basin.... for the period of time and for any class of uses for which permit applications are precluded." This condition applies to all of the granted water reservations except for the municipal reservations. The Board concluded that with this condition, there would be no adverse affect to existing water users and encouraged the objectors to close the basins to new appropriations if in fact there was no more water legally available.

In response, Rep. Mike Foster introduced the Upper Missouri River basin closure, Rep. Sam Rose introduced the Teton River basin closure, and Senator Chuck Swysgood introduced the Jefferson/Madison basin closure. The various closures were supported by the Montana Stockgrowers, Montana Farm Bureau, Montana Water Resources Association, the Montana Power Company, and eventually by the DFWP and Trout Unlimited. The only controversial issue was proposed amendments that either eliminated the Board condition altogether or completely eliminated the instream flow reservations. Neither of these amendments was successful.

While there is debate over the interpretation of the Board's condition, if a permit application is allowed under the basin closure, then proof of legal water availability must consider the extensive instream flow and consumptive use water reservations in addition to other existing water rights.

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